



## **WATER RESOURCES RESEARCH GRANT PROPOSAL**

**Project ID:** 2002NC2B

**Title:** Reduced Cost Strategies for Regional Integration of Surface and Groundwater Use

**Project Type:** Research

**Focus Categories:** Water Quality, Models, Management and Planning

**Keywords:** Water Resources Development, Groundwater Management, Water Treatment Facilities, Resource Planning

**Start Date:** 03/01/2002

**End Date:** 02/28/2003

**Federal Funds Requested:** \$18,979

**Non-Federal Matching Funds Requested:** \$37,958

**Congressional District:** 4th

**Principal Investigator:**

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**Abstract**

A regional model reflecting the costs of developing new water supplies as a result of groundwater pumping restrictions will be constructed for the Central Coastal Plain of North Carolina. The model will be based on relationships that describe the effects of increasing scale on the capital, operations, and maintenance costs of water supply systems, including (i) raw water acquisition; (ii) water treatment; and (iii) finished water transmission and distribution. Results will yield information on the costs of switching a water system from groundwater to surface water, or a combination of both. The model will evaluate the costs of water for individual communities based on available water sources. The model will be further developed to accommodate the consideration of regional treatment facilities serving multiple communities from multiple water sources. Finally, with the provision of inputs describing available water sources (e.g., location, availability, quality) and the communities to be served (e.g., population, location), the model will generate minimum cost scenarios through the specification of optimal combinations of water sources, treatment technology, facility capacity, and facility location. A central theme in model development will be the antagonism between the increasing returns to scale exhibited by treatment facilities and the decreasing returns to scale in water distribution.